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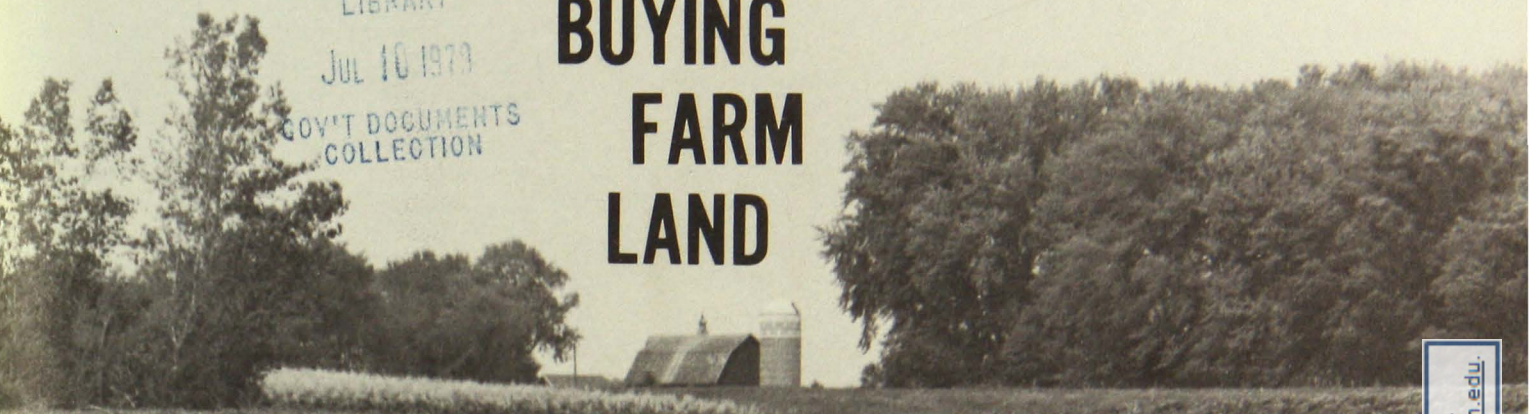
BUYING FARM LAND



What Is it worth? Can I afford it?

by Paul R. Hasbargen
and
Kenneth H. Thomas

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BUYING FARM LAND
What is it worth? Can I afford it?

Paul R. Hasbargen and Kenneth H. Thomas*

Farm land values in Minnesota almost tripled between March 1972 and February 1977. Minnesota's increase (191 percent) was topped only by Iowa (225 percent) and Illinois (204 percent).[1] Such a marked change has anyone thinking of buying farm land asking this question: Is land really worth that much and can a potential buyer afford to pay current asking prices?

This publication is to aid potential land buyers or sellers. Part I describes a four-step framework for making land decisions. Part II contains a discussion of land values and land earnings in the future. Parts III and IV outline procedures for answering the question: What is land worth and how much can I afford to bid? Part V outlines tax, title, and other considerations after the decision to buy or sell a farm has been made.

Part I. Decision Framework For Potential Land Buyers/Sellers

Under present conditions, the farmer in good financial shape who wants to invest in land may find this as good a time as any to buy. This is particularly true if the land is a parcel the farmer has been wanting to buy and may not have another chance at soon. At the other extreme, the average to below average farmer who is in a weak financial position and has poor repayment ability should probably not even consider buying land now.

For the potential land buyers somewhere in between, a careful analysis should precede the decision.

STEP 1—SIZE UP THE PRESENT OPERATION

"Buying a farm is a momentous transaction in the life of the average farmer. Someone has said, Getting a good producing farm is next in importance to getting a wife who is a good help-mate."[2] Though that was written in 1934, buying a farm still represents a major crossroad in the life of a farm family. Thus it is an ideal time to size up one's present farming operations.

Take a hard look at your track record. Are you doing a good job? Are you strong in crop production or do you prefer livestock? Do you need to expand or just do a better job? As one outstanding farm manager said recently, "When making a major decision we like to see how it fits in with what we have been doing. Does it make sense? When we start flying by the seat of our pants, that's when we often begin to create problems rather than solve them."

Also, look at yourself and your family situation. Are you buying this farm for current or future family needs or are you just creating estate tax and transfer problems/and/or additional management problems for your widow or widower?

STEP 2—CONSIDER ALTERNATIVES TO FARM OWNERSHIP

Land can be characterized as a good "growth stock," but a poor investment if considered for cash earnings or annual "dividend" payments. Therefore, each potential buyer must ask: Am I in a position to get involved with a growth stock or do I need investments offering high immediate cash returns? A generally accepted ranking of farm investments from high to low according to annual cash returns on investment follows:

- Operating costs expended on recommended production practices.
- Investment in livestock and facilities, especially hogs.
- Investment in machinery.
- Investment in land.

With the current rush to buy land, don't overlook possible investments in production practices or the livestock sector. Success in farming does not depend on land ownership; there are other methods of controlling land use. Rental is the major alternative to buying. This enables the individual with less equity capital to acquire the use of land without a large capital outlay. The annual cost of using land can be either cash rent or a share of the crop produced.[3] A manager may also gain access to land use through merger with other land owners through partnership, corporate or joint-venture type arrangements. Many young farmers use one of these approaches. The most desirable method of controlling land depends on the situation. This is strongly influenced by the market price of land, the expected earnings from land (including appreciation), terms of borrowing versus leasing, investment alternatives, and the individual's planning horizon.

Farmers looking for ways to diversify investments or increase their liquidity may wish to consider nonfarm investments.

STEP 3—ANALYZE LAND PURCHASE ALTERNATIVES CAREFULLY

Analyze the alternatives carefully after deciding to seriously consider buying a farm. Two major questions need to be answered: First, what is a given farm likely to be worth to the typical buyer? Second, how much can I afford to bid for this farm?

Farm land values vary greatly within and among geographic areas of the state. In 1976 there was a difference of $896 per acre between southwestern and northeastern Minnesota ($1,106 vs. $210).[4] Likewise, farm sale prices will usually vary by more than 100 percent within any given area of the state. Thus, potential buyers (or sellers) should have a careful appraisal made, particularly if they are not familiar with the farm or present land market conditions. Part III of this publication provides information on procedures used in making a complete farm appraisal.

*The authors are extension economists and professors, Agricultural Extension Service and Department of Agricultural and Applied Economics, University of Minnesota.

[1] "Farm Real Estate Market Developments," CD-82, ERS, USDA, July 1977.

[2] Cavert, W.L. and G.A. Pond, "Suggestions to Purchasers of Farms," Minnesota Agricultural Experiment Station Bulletin 309, September 1934.

[3] A description of current rental agreements in Minnesota can be obtained from the publication "Land Rental Arrangements in Minnesota," Economic Report 77-7, available from county Extension offices.

[4] R. Christianson, S. Nelson, and P. Raup, "The Minnesota Rural Real Estate Market in 1976," Economic Report 77-3, Department of Agricultural and Applied Economics, University of Minnesota, March 1977.

It is also important to distinguish between the market price for land (what it is worth to the typical buyer) and what an individual farmer can afford to bid for the land. The market price is determined largely by the number and "means" of the farmers and other investors bidding and on the amount and quality of land available. The amount that a buyer can afford to bid depends largely on management abilities, cost structure, and current financial position. Part IV focuses on "how much can I bid for land?," approaching it from a return, repayment, and risk standpoint.

STEP 4—CONSIDER TAXES, TITLES

If you do buy a farm, carefully consider the income tax aspects of the purchase. The way the property is titled will likely affect your future estate plan and taxes. Part V discusses these and other issues.

Part II. Land Prices And Earnings: Past And Future

Future land values and earnings are key concerns to prospective land buyers since both factors have a marked influence on how financially sound and profitable a land investment will be. Annual average land earnings not only influence the profitability of the investment but also determine whether land payments can be met. Appreciation in land values will influence the buyer's borrowing capacity as well as long-term earnings on the land investment. The historical and likely future course of land prices and land earnings is discussed in this section. With this as background, potential buyers should develop their own set of expectations.

LAND VALUES: PAST, PRESENT, AND FUTURE

Spurts in farm land values in Minnesota are not new. From 1912 to 1920, land prices about doubled, moving from $50 to slightly over $100 per acre. Then a long, precipitous decline began, dropping land to $43 per acre by 1940. Older farmers who remember this price drop view the recent trebling of land values with considerable fear and trepidation.

The experiences of most younger farmers, however, include only the land price increases since 1945, post World War II. The track record during this period has been a series of five "spurts" in land values: 1945-48, 1951-52, 1957-59, 1966-68, and the present surge since 1972 (table 1). After each of the first four spurts, land values tended to level off for 2 to 6 years and then resume the climb.

The recent (1972-77) surge in land values can best be described as a "geyser" rather than a "spurt." Land values increased more, on a dollar per acre basis, in 1976 than from 1946 to 1966. Two questions need answering: What caused such a drastic increase and what is the likely future course of land values?

A comparison of major causes of land price increases in the past with those of recent years should prove helpful in answering why the recent sharp rise.

Past causes	Current causes
- Crop technological developments	- Improved farm earnings
- Government support programs	- Limited investment alternatives
- Increased machine size	- Easier financing: "windfall" profits
- Easier financing: contracts, government loans	- Provide opportunity for son - Land as inflation hedge

These lists show that earlier more gradual increases in land values were caused by factors that provided a strong, but stable undertone to the land market. Recent sharp increases grew from a unique set of circumstances that placed extremely heavy upward pressure on land values: a sharp upswing in crop farm earnings providing the cash for sizable downpayments and repayment capacities; lack of good alternative investment

Table 1. Average estimated value per acre and dollar and percentage change from previous year—Minnesota—1946 to 1976[a]

Years	Average value per acre[b]	Change from previous year $/acre	Change from previous year %	Years	Average value per acre[b]	Change from previous year $/acre	Change from previous year %
1946-47	$ 72	$ 7	10.8	1961-62	$159	$ 3	1.9
1947-48	79	7	9.7	1962-63	161	2	1.3
1948-49	83	4	5.1	1963-64	166	5	3.1
1949-50	85	2	2.4	1964-65	171	5	3.0
1950-51	99	14	16.5	1965-66	183	12	7.0
1951-52	107	8	8.1	1966-67	194	11	6.0
1952-53	105	−2	−1.9	1967-68	211	17	8.8
1953-54	113	8	7.6	1968-69	223	12	5.7
1954-55	121	8	7.1	1969-70	227	4	1.8
1955-56	126	5	4.1	1970-71	232	5	2.2
1956-57	138	12	9.5	1971-72	248	16	6.9
1957-58	147	9	6.5	1972-73	298	50	20.2
1958-59	157	10	6.8	1973-74	423	125	41.9
1959-60	155	−2	−1.3	1974-75	525	102	24.1
1960-61	156	1	0.6	1975-76	667	142	27.0

[a]Source: R. Christianson, S. Nelson, and P. Raup, "The Minnesota Rural Real Estate Market in 1976," ER 77-3, Department of Agricultural and Applied Economics, University of Minnesota, March 1977.
[b]Average estimated land value per acre, July to July basis.

opportunities in either the livestock or nonfarm sectors; the need for farm enlargement to expand use of large investments in machinery; the need to provide farming opportunities for sons who now see farming as a good source of employment; and the realization that farm land is a good hedge during a period of rapid inflation.

It is likely that land values will continue to increase over the longrun since land supply is limited and world demand for food will continue to increase. Inflation will likely remain a problem so this will put added upward pressure on land prices. However, land values are not expected to increase as rapidly as in the past 5 years since farm income is not expected to make another large increase—at least not during the next few years. Nor should continuous increases in land prices of the past 20 years be expected to continue without interruption since world market conditions will likely give rise to more variation in farm earnings (see discussion on farm earnings). In fact, some short-term declines in land values could occur if the worldwide grain supply buildup of 1976-77 continues for any extended period.

FUTURE EARNINGS FROM FARM LAND[5]

The sharp increase in crop farm earnings starting in 1973 was an important factor in the recent climb in land prices. This earning's increase was caused by a so-called strong demand-pull type increase in grain prices. Its basic causes: the divergent trends in world grain production and consumption. During 1970-72, annual world grain consumption exceeded production and caused a draw-down in stocks. This situation coupled with a poor crop worldwide in 1972-73 and large Soviet purchases caused the sharp climb in grain prices. Since this was a demand-pull rather than a cost-push type increase in prices, net crop farm earnings went up even faster, percentagewise.

It seems reasonable that the trend in the real price of grains will be upward during 1975-2000. Both demand-pull and cost-push type factors will likely bring this about. On the demand-pull side, the world's population is expected to double again in about 35 years. Likewise, rising real incomes in developed countries will change food patterns and increase the desire for more animal products. Meeting this marked increase in demand for grains and protein will not be easy or cheap. Exceptional weather and improved technology would definitely improve supply conditions and moderate price increases. However, it is likely that providing adequate supplies will be possible only if more land is cultivated, and greater use is made of water and energy-related production factors such as fertilizer, chemicals, and power for irrigation. All of these approaches will provide a cost-push effect to rising food costs.

Assuming an increase in product prices, what does this mean for farm land earnings? First, residual earnings to land from crop production will likely increase, but slower than product prices. This reflects the expected increase in costs associated with increased production. Second, both product prices and farm earnings will probably fluctuate widely. Unpredictable weather and technological developments will cause supplies to fluctuate around the upward march of consumption needs. With increasing costs and narrowing margins, price fluctuations will cause wider swings in net earnings than in product prices. Therefore, land buyers in a shaky financial position should carefully evaluate their ability to withstand periods of adverse earnings.

Part III. What Is Land Worth?

Land values vary greatly in Minnesota, even within the same county. Before bidding on a farm, a prospective buyer should determine what land might be worth to the typical buyer. This implies a land value appraisal. This section discusses factors that affect land values as well as three approaches farm appraisers use in determining farm value. Then Part IV examines the decision as to whether the farm would be worth more or less to a specific buyer.

MAJOR FACTORS AFFECTING FARM VALUE

Factors affecting farm value can be grouped as: economic, physical, locational, and aesthetic.

Economic factors. Land has value as a resource in farming because of its anticipated future net earnings. The present value buyers and sellers place on these expected land earnings is the major factor affecting the price of farm land. This means that future crop yields, crop prices, expenses, and the desired rate of return on investment help determine the sale price.

Physical factors. The major physical factors affecting farm value are topography, soils, and buildings and improvements. Topography can be a major factor affecting land use. It also affects the size of machinery that can be used, soil erosion hazards, and soil drainage and waterholding capacity. Soils in Minnesota are classified by the Minnesota Cooperative Soil Survey and shown as mapping units in soil survey reports. The potential farm buyer should obtain a description of the soils on the farm in question from the local county Soil Conservation District Office (SCS) or Extension office.[6] The crop production rating of these soils should then be checked with SCS and Agricultural Extension Service personnel. A University of Minnesota Experiment Station Bulletin, "Crop Equivalent Rating Guide for Soils of Minnesota," provides this information on a statewide basis.[7]

The existing buildings and improvements on a farm will either add to or detract from the value of the farm.

Location—climate and community factors. Climate limits the kinds and yields of crops that can be grown in any particular area of Minnesota. Average rainfall varies from a low around 19 inches in northwestern Minnesota to a high around 32 inches in southeastern Minnesota. The average growing season varies from about 100 days in northern Minnesota to 160 days in southeastern Minnesota. In addition, the frequency of offseason frost increases northward in the state.

The low rainfall patterns of western Minnesota increase the chances for drought and decrease potential crop yields in comparison with eastern Minnesota. Table 2 shows the influence of these locational factors on land values in southwestern Minnesota. Note that the superior location coupled with the superior soil in the low risk area results in an average per acre value that has been running more than twice the average value in the high risk area.

Local community factors can also affect land values for many different reasons. There may be aggressive buyers in a certain community bidding up land prices. Other communities may have special market outlets and high return contract crops which tend to push up land prices. Farms near urban areas and large cities will feel the influence of the demand by rural residents, part-time farmers and city investors on land prices. In contrast, farms remote from large towns and difficult to reach will command lower prices.

[5]For a further discussion of possible future prices and earnings, see: "The Price of Farm Products in the Future," Willard W. Cochrane, Minnesota Agricultural Economist, No. 589, May 1977.
[6]Ask the local Agricultural Extension Service office if soils in a particular part of the state have been mapped.
[7]This bulletin, Miscellaneous Report 132, 1975, is in county Agricultural Extension Service offices.

Table 2. Comparison of average sales prices per acre in the high risk, transition, and low risk areas of Minnesota—1972 to 1975*

Year	High risk area†	Transitional area†	Low risk area†
	dollars per acre		
1972	214	319	455
1973	217	348	522
1974	325	532	794
1975	480	653	1,145

*Source: R. Christianson and P.M. Raup, "The Minnesota Rural Real Estate Market in 1975," Economic Report 76-1, Department of Agricultural and Applied Economics, University of Minnesota.

†The high risk area includes Traverse, Stevens, Pope, Big Stone, Swift, Lac Qui Parle, Chippewa, Yellow Medicine, and Lincoln counties. The low risk area includes Nicollet, Brown, Cottonwood, Watonwan, Blue Earth, Waseca, Jackson, Martin, and Faribault counties. The transitional area includes the other southwestern Minnesota counties between the two groups.

Aesthetic factors. Since aesthetic values vary greatly with the individual, it is difficult to assign an objective value for some factors. These include current eye appeal of buildings and the scenic view from the house, which will either add to or detract from farm value. Potential owners also place different values on rivers, lakes or wooded areas on a farm.

ALTERNATIVE APPROACHES TO DETERMINE VALUE TO TYPICAL BUYER

There are three major approaches to estimating farm land values: the market approach, the cost approach, and the income approach. For many years the income approach overshadowed the others. However, with recent instability of farm prices and costs, the market data approach has gained importance. A competent real estate appraiser uses all three approaches.

The Sales Or Market Data Approach

The sales or market data approach entails a comparison of the farm being appraised with comparable farms recently sold in the area. This approach is based on the principle that existing market forces are the best indicators of current market value.

The market data or sales comparison approach involves selection of comparable recent sales in the area, proof that each is a bona fide farm sale, and proper adjustment in expected price for differences between the farm being appraised and comparable sales. Since no two farms are alike, the appraiser using the comparable sales approach must select farms as similar as possible to the farm being appraised in location, size, soil productivity capacity, and buildings and improvements. If the farm being appraised is a dairy farm, comparable sales considered should be dairy farms. Sales examined should always be the most recent ones.

Table 3. Form for comparing market value of subject property with sale properties

Sale no.	1	2	3	4	5
Purchaser	Hawkins				
Date	5/76				
Size	160				
Sale price	$800				
	Adjustments per acre*				
Time (year of sale)	+$80				
Size of farm	0				
Productivity	+20				
Buildings and improvements	−10				
Location	−5				
Other	−10				
Total net adjustments	+75				
	Indicated value of subject farm being appraised				
Sale price (above)	$800				
Net adjustment	+75				
Indicated value of farm being appraised	$875				

*Use plus sign if farm being appraised has advantage over sale property; minus sign if disadvantage.

Table 4. Average estimated value per acre of farm real estate in Minnesota, 1967 to 1976 *

Year	South-east	South-west	West central	East central	North-west	North-east	Minn.
1967	$262	$ 303	$163	$128	$108	$ 62	$194
1968	286	333	181	134	122	57	211
1969	308	350	196	146	120	54	223
1970	317	347	198	161	120	62	227
1971	333	351	204	155	119	63	232
1972	370	379	208	163	117	76	248
1973	433	459	247	194	146	115	298
1974	576	675	378	279	199	144	423
1975	674	844	503	296	295	163	525
1976	856	1106	624	349	378	210	667

*Source: R. Christianson, S. Nelson, and P. Raup, "The Minnesota Rural Real Estate Market in 1976," ER 77-3.

To determine whether the comparable sales actually represent market value, appraisers must find out the motivating factors of both seller and buyer. The American Society of Farm Managers and Rural Appraisers recommends that appraisers be guided by this definition when checking comparable sales: "Market value is the highest price estimated in terms of money which the property would bring if exposed for sale in the open market; with reasonable time allowed in which to find a purchaser, buying with knowledge of all of the uses and purposes to which it is adapted and for which it is capable of being used."[8]

The comparable sales selected must be studied carefully and price adjustments must be made for differences between them and the farm being appraised. The important factors to consider when adjusting sales prices include: land productivity, buildings and improvements, location of farm, size of farm, and time of sale. Table 3 provides a format for adding up the pluses and minuses reflecting differences in the per acre value between the subject and comparable sale farms for each of these five factors. The rule to remember in filling out the table is to give a plus sign to the adjustment when the farm being appraised (the subject farm) has the advantage and a minus sign when the subject farm has the disadvantage.

Time. Data like that in table 4 will be needed for the area in question in order to make adjustments for the time of sale factor. Suppose a farm in west central Minnesota is being appraised in 1977. Adjustments could be made in earlier sales on the basis of the data in column 3, table 4. A sale made in 1975 would have to be adjusted upward by about 24 percent to make it comparable to a 1976 sale: ($624÷$503=1.24). And if there was, in the appraiser's judgment, another increase in land values in that particular area of 10 percent in 1977, the total increase in land price per acre of the comparable sale should be 36 percent rather than 24 percent: (1.10 × $624=$686÷$503=1.36).

Size. On a per acre basis, small acreages usually bring a higher price than large acreages because there are usually more potential bidders on the smaller acreages. However, if tract size becomes too small or fields are irregularly shaped, bid prices drop on a per acre basis because of higher machine costs in operating the farm. What is considered "small" or "large" varies: the average size of farm and machinery is much larger in the Red River Valley than in southeastern Minnesota or nearer the Twin Cities.

Productivity. The percentage of acreage that is tillable and the percentage of acreage with highly productive soil types are the two most important variables affecting the productive capacity of a farm. Before making an adjustment relative to the comparable sale property for the productivity factor, the appraiser should study SCS maps to compare the comparable sale farm with the tract being appraised. He should also contact the local Agricultural Stabilization and Conservation Service (ASCS) office and/or operators and neighbors familiar with the historical crop yields on the farm. Tillable land should be divided into at least three productivity classes with an adjustment made in the average per acre value based on price variation among land qualities. An adjustment must also be made for differences in the proportion of tillable land on the comparable sale farm versus the farm being appraised. These two factors would constitute the adjustment entered in the productivity line in table 3. The data in table 5 indicate the great variability that can be found in land prices because of productivity differences in the same area of the state. Land rated "good" in the Red River Valley averaged almost five times the price of land rated "poor" in the adjacent non-Valley area in 1975 and 1976.

[8]"Professional Rural Appraisal Manual," American Society of Farm Managers and Rural Appraisers, Inc. Fourth Edition, January 1975. p.21.

Table 5. Percent of sales and sales prices per acre by quality of land, Red River Valley and non-Valley area, Northwest District, Minnesota—1975 to 1976*

Land quality	Red River Valley				Non-Valley area			
	1975		1976		1975		1976	
	%	$	%	$	%	$	%	$
Good	58	659	62	920	24	321	30	311
Average	39	445	25	615	50	222	48	304
Poor	3	177	13	243	26	142	22	200

*Source: R. Christianson, S. Nelson, and P. Raup, "The Minnesota Rural Real Estate Market in 1976," ER 77-3.

Buildings and improvements. Since buildings and improvements cannot normally be sold separately from the farm, their added value is usually considerably less than replacement costs minus depreciation. The appraiser must examine comparable sales closely to estimate what the market is actually paying for existing farm buildings. Sometimes buildings actually detract from the average market price of farm property. For many years this has been observed in examining data of farm sales in the Red River Valley. Yet, in the dairy belt of central Minnesota good dairy buildings can add a significant proportion of the sale value. A modern cattle feeding facility on a farm in that same dairy area will not add as much as it would in southwestern Minnesota where there is more cattle feeding. It takes an experienced appraiser who examines many comparable sales to determine what the market is actually paying for farm improvements.

Location. The quality of roads, distance from markets as well as from schools, churches, and shipping centers are important in evaluating location. The appraiser must determine how each of the sales used in the market data approach would have been affected had the farm been located in the same place as the one being appraised. Again, past experience as well as sound judgment will be necessary to make the appropriate plus or minus adjustments.

Finally, several *other adjustment* factors should be considered before running a total: whether or not the farm was sold on contract for deed; whether there are any special encumbrances on the deed; whether it had proportionately greater or smaller acreage allotments for such crops as sugarbeets, corn, wheat; or whether any other unusual factors might have influenced the market price. If the comparable farm is too unusual in some of these aspects it should not be used in the market data approach. Table 3 shows a value adjustment based on the judgment that sale 1 had a superior scenic view.

In filling out table 3 on comparable sales, put the correct sign in front of the adjustment figures so that they add up to a final adjusted price per acre for the subject farm relative to each comparable sale property. (Remember the rule, add when appraisal or subject farm has the advantage.) The final line in the table, "indicated value of appraisal farm," is an estimate of the market value based on a comparable sale at a previous time. Several other comparable sales should also be analyzed before the appraiser decides which one or more are the best indicators of the value of the farm being appraised.

The Cost or Inventory Approach

In the cost approach the appraiser must inventory and place a value on each resource on the farm. This includes placing a separate value on each type of land that can be classified. Each building and improvement on the farm will be given a replacement value less depreciation, including an obsolescence charge.

The values assigned to land classes should be based on comparable sales in the area. This approach to obtaining land values is similar to the sales or market data approach. However, here the parcel of land should be classified in greater detail as to acres of woods, permanent pasture, wasteland, quality land classes, and soil types according to SCS maps when available. The values of the different soil classes should be obtained from comparable sales of unimproved land that is predominantly of one soil type or another. After adjustments to current market conditions they can be used directly to value the acres in each soil type. Each building is listed separately with an estimate of today's replacement based on local square footage costs. Depreciation to date, obsolescence, or unusual physical deterioration which will need improvements before use are estimated. The value of tiles and fences are usually included in the land value. Special fences, however, should be given separate values.

The cost or inventory approach is especially useful on smaller farms (of 160 acres or less) where buildings and improvements represent a major proportion of the farm value. In Minnesota, this is most successfully used with dairy farms and small farms near cities.

The Earnings Or Net Income Capitalization Approach

The earnings approach means capitalizing the average annual net income that can be expected from the farm being appraised. One approach is based on the total farm unit from a farm operator's standpoint; another is on only the landlord's income and expenses. The latter method is simpler and more commonly used. It also provides the buyer with the amount the farm would be worth if it were rented at some future date. The total farm unit approach is discussed in Part IV.

Table 6 gives an example of the earnings approach to estimating land value, using the landlord's earnings approach. The first part is used to estimate the normal gross income that can be expected given average yields and prices. Landlord cash rents for pasture and buildings are included rather than the livestock sales that might be included if the owner-operator, total-unit approach were being used. All expenses associated with the ownership of the property are listed in the center of the form. A management charge is included in the landlord's expenses.

Selecting a proper capitalization rate is important in this approach. This is normally based on the historical ratio of land prices to net earnings. This ratio has almost always been less than prevailing interest rates. Historically, land owners have been satisfied with a 4 to 5 percent return on investment from annual crop earnings since they have experienced additional investment returns through inflation of land values (table 1).

The capitalization rate should be obtained from the market from comparable sales data. However, do not base it on sales in only one or two years, especially if these were unusual income years. For example, in 1973 and 1974 earnings on land of over 7 percent were not unusual. Current ratios are probably at or below the 4 to 5 percent level. Note the explanation at the bottom of table 6. The appraiser is expected to explain the source of the lease terms and capitalization rate. The wide range of capitalized land values observed in table 7 illustrates the need for great care in estimating net income and selecting appropriate capitalization rates.

Correlation Of The Three Approaches To Value

A thorough appraisal involves the use of all three approaches to estimate the current value of a farm. The market data approach is especially useful in times of rapidly changing farm prices and incomes when estimating "normal" net income and current capitalization rate is difficult. It is an important method to use when farm values are being significantly influenced by other factors, such as demand from urban areas for rural residences or commercial development.

The cost approach will be important when the value of buildings and improvements is relatively high and/or accurate current value estimates are desired for setting up a depreciation schedule on farm improvements.

If earnings from the land are counted on to meet annual land payments the earnings approach should be given major consideration. Rather than using typical landlord rents, expected net earnings based on the buyer's cost structure and yield expectations should be used. Also examine expected repayment capacity compared with the best loan terms available. These procedures are described next.

Table 6. Earnings approach to value

Estimated income: Based on typical management and average yields under conditions as of _____ (date of inspection)

Crop	3 Year county average yields	Acres	Average yields	Total production	Rent share	Average price	Share to owner
Corn	100	222	100	22,000	½	2.25	$24,965
Beans	33	100	35	3,500	½	5.00	$ 8,750
Pasture and lots		16				20.00	$ 320
Roads		10					$
Total		348					$

Privilege rental for buildings and/or pasture to owner only $

Owner's share of gross income $34,035

Source of price data: "University of Minnesota Suggested Farm Planning Prices," FM 25

Estimated expenses: Based on average which should result under typical operation.

Real estate taxes: Expected long-term annual tax	$ 3,900
Assessed value 1977: $69,975 Tax rate: $65.28 Tax: $3,855	
Drainage or special tax—Estimated	$ 100
Insurance on buildings $35,100 Coverage @$ .80 per $100	$ 280
Maintenance and recapture of buildings @6%	$ 2,100
Maintenance of fences, tile and other improvements	$ 500
Seed: $1,400 Fertilizer: $4,000 Chemicals: $1,600	$ 7,000
Harvesting, drying and delivery-shelled corn	$ 1,200
Other expenses _____	$
Management: estimated at 5% (professional is 10%)	$ 1,700
Owner's estimated gross expenses	$16,880
Owner's estimated net earnings	$18,155
Based on a capitalization rate of:	4.5%
The indicated value of the subject property by the earnings approach is:	$403,444 or $1,160/acre

Explanation of lease terms used:
Lease terms used are typical in neighborhood. Existing lease is verbal and terms agreed on years ago now considered obsolete.
Further analysis of capitalization rate used:
Comparable sales of farms were analyzed for capitalization rates for comparison. Rates of return were in the 4 to 5 percent range in 1976.

Table 7. Capitalized values per acre using different estimates of net income and capitalization rates

Net income per acre	Capitalization rate		
	4.0%	5.0%	6.0%
	estimated dollar value per acre		
20	500	400	333
30	750	600	500
40	1,000	800	667
50	1,250	1,000	883
60	1,500	1,200	1,000
70	1,750	1,400	1,167

Part IV. What's The Maximum Price I Should Bid?

Appraisal procedures just described can be useful to both buyers and sellers in determining pricing objectives and strategies. However, the appraisal value of the farm does not constitute the actual market price—the farm hasn't been sold yet! Since the first offer is seldom the highest price the buyer would pay or the lowest offer the seller would accept, both parties should be prepared to bargain to determine the market price.

In formulating a bargaining strategy, a buyer should consider urgency of need for that particular tract of land, the pressure on the seller to generate cash, and the alternatives open to both parties. But before one can bargain effectively in the present high land price climate, one must be able to answer this question: How much can I afford to bid for this farm? This must be answered both from an investment and from a financial or repayment and risk bearing standpoint.

WHAT'S IT WORTH AS A LONG-TERM INVESTMENT?

What you can afford to bid for a farm and still make it a profitable long-term investment depends on your situation (whether you are an expansion buyer or an investor or base unit buyer) and your desires and expectations regarding the following:

- Expected annual net returns to land.
- Expectations as to capital gains—land appreciation.
- Desired rate of return on investment.
- Financing terms and tax position.
- Length of planning horizon and eventual disposition of property.
- Other factors: desire to control land, proximity to home farm, etc.

Making A Ball Park Estimate Using The Earnings Approach

To get a ball park estimate as to what land is worth to you or what you could afford to bid and still have a profitable long-term investment, use an earnings or income approach similar to that previously discussed. The capitalization formula is: Net returns to land divided by the capitalization rate equals the land value or bid price (table 6)

Normally, an *investor-buyer* should use the *landlord's earnings approach* described in the previous section. If an appraisal has already been made using this approach, the potential investor-buyer will merely have to review the analysis and make necessary adjustments.

The *farmer-buyer*, however, should look at it from an *owner-operator* rather than a landlord's standpoint. Using a budgeting procedure such as the one on page 14 is recommended.

First, list the crops (by acreage and expected yield of each) to be grown on this land. This should represent a longer-term estimate of production expectations based on one's own management. Expected prices will then have to be determined to arrive at the expected gross income from the land. Again, these prices should represent long-term expectations, not just current crop prices. Because of current uncertainty regarding future prices, use conservative prices as a base estimate and then test the sensitivity of price changes on land values. Remember that estimates of prices in the next 3-5 or 5-10 years are more important to the decision than those 10-20 years hence.

Turning to expenses, operating costs will vary according to size and value of the unit, type and intensity of operation, level of management, and the land's physical characteristics. A farm purchased as the base unit will involve a different cost structure from the one being added to an existing unit, because overhead costs do not always change in the same proportion. Machinery and labor costs are prime examples. Include real estate taxes and an allowance for upkeep, insurance, and other overhead. The difference between projected income and costs will represent an estimate of the residual return to land being considered.

The next task is to select a capitalization rate or *desired return on investment factor. The going market rate approach*—the ratio of average earnings to land values—typically 4-5 percent—is one option. This ratio will tend to be lower in the low risk areas or where competition for land is high. And, as competition for land increases in the face of continuous inflation, net annual earnings will probably be driven down to 3 percent or less. The ratio will be higher in higher risk areas or areas of less competition. However, in all areas it will be less than the rate of interest paid on savings accounts since an additional "growth dividend" is expected from land investment that is not available from a savings account.

A *second method, the opportunity-cost approach*, is considered by the authors to be more flexible and economically sound when selecting the proper capitalization rate for a particular situation.

Consider the following factors when selecting an appropriate capitalization rate if the opportunity cost approach is used:

- Returns expected if money is invested elsewhere.
- Annual appreciation in land values.
- Land needed for expansion—so will accept lower return.
- Risk of crop loss—want higher returns in higher risk areas.

For example, someone who thinks a 10 percent return is possible on money invested elsewhere would accept a 4 percent farm return, if anticipating an annual 6 percent appreciation in land values. But if widely fluctuating crop yields are expected, one might want a 6 percent average crop return. On the other hand, if the land is really needed for expansion, a 3 percent return might be acceptable for an expansion buyer purchasing adjacent acreage.

Therefore, since some buyers accept capitalization rates as low as 3 or 4 percent don't expect to be the successful bidder if you use a capitalization rate of 5 percent or more unless your expected net returns per acre are significantly above those of the other potential buyers.

Once the capitalization rate has been selected, divide it into the residual return to land to determine the capitalized value of the property. Make needed adjustments for location, buildings, and other factors. Then compare the result with the asking price for the farm. If the asking price is higher than the value projected, it is a relatively poor investment opportunity. If the asking price is lower than the projected value, then a good investment opportunity exists since the expected return would be higher than the capitalization rate used.

Because of the uncertainty surrounding current conditions, also test the sensitivity of the initial analysis to changes in prices, yields, costs, and capitalization rates (see bottom of worksheet page 14). Table 8 illustrates the wide range of prices that one could bid under different price and cost expectations and capitalization rates.

If the buyer knows the asking price for the farm and would rather look directly at the land purchase on a return on investment basis, simply divide the residual return to land by the adjusted asking price for farm, to determine the percent return on investment.[9] This would represent the cash return on investment. Adjustments for inflation, risk, and expansion needs should be made and the final figure compared with expected returns on other investments.

Table 8. Capitalized value of land under varying crop prices and capitalization rates*

Corn/bean price	Net/acre	Capitalization rate (%) 4%	5%	6%
$1.75/4.00	$ 22	$ 550	$ 440	$ 365
2.00/4.50	44	1,100	880	735
2.25/5.00	67	1,675	1,340	1,115
2.50/5.50	90	2,250	1,800	1,500
3.00/6.50	133	3,325	2,660	2,215
With a change of:		Changes in land value/acre		
Price: 25¢ on corn and 50¢ on beans	($ 22)	$ 550	$ 440	$ 365
Net: $10 per acre	($ 10)	250	200	165

*Assumptions: Yield, 110 bu. corn and 34 bu. beans. Rotation, ½ corn and ½ beans. Costs, $142/acre.

Making More Detailed Analysis Of Investment Returns

The preceding approach was designed to help the potential buyer arrive at a ball park estimate as to what price could be bid on a farm while still getting a desired return on investment. Often such an estimate is sufficient. However, there are several assumptions in this procedure relative to method of financing, terms of the loan, and income tax situation of the buyer that will not hold for all buyers.

Table 9 illustrates the possible impact of variations in these and other factors. This analysis, using relatively complex capital budgeting procedures, indicates that the three factors stressed in the previous procedure, namely, expected returns per acre, capitalization factor, and expected appreciation in land values have the greatest impact on the maximum bid price for a farm. But, if terms of financing (interest rate and downpayment) are varied over a wide enough range these factors can also be quite important. However, these factors will seldom vary over as wide a range as shown in table 9.

The two tax variables studied, namely, marginal tax rates and the capital gains tax, tended to have minor effects on the maximum bid price. The effect of the marginal tax rate is minimized because the reduction in expected annual net returns per acre due to higher income tax rates are almost completely offset by tax deductible interest payments, especially during the first half of an extended pay back period. The small effect of the capital gains tax is because the difference between the purchase and projected sale price is discounted from 20 to 30 years in the future.

Thus, the simpler procedure discussed earlier appears to provide an adequate estimate of farm value as a longer-term investment. To make more detailed analyses, discounting procedures are needed. With the advent of the computer, these are becoming more readily available.

[9]From the original asking price subtract any positive adjustments such as location, buildings; add any negative adjustments.

Table 9. Sensitivity of maximum bid price to changes in the input variables

Input variables	Range of values of input variable	Corresponding range in maximum bid price	High bid price as % of low
		$/acre	
A. *Terms of mortgage financing*			
Interest rate (IR)	.06-.14 per yr.	$824-$590	140
Down payment (DP)	0-1.0	$742-$584	127
B. *Opportunity cost of capital (CC)*	.06-.14 per yr.	$941-$536	175
C. *Land prices and inflation*			
Average price of comparable parcels (P)	$400-$800 per acre	$606-$783	129
Expected rate of inflation in land values (INF)	0-.15 per yr.	$512-$1,782	348
D. *Income and tax variables*			
Income per acre (ANI)	$ 20-$100 per acre	$437-$1,124	257
Growth in net income per acre (GNI)	0-.06	$633-$865	136
Marginal tax rate (MTR)	0-.5	$739-$655	112
Capital gains tax (T*)	0-.25	$749-$695	107
E. *Time horizon and loan amortization period* (n.t.)	5-20-35 years	$653-$695-$678	106

Source: W. F. Lee, "A Capital Budgeting Model for Evaluating Farm Real Estate Purchases," *Canadian Farm Economics*, Vol. 11, No. 3, 1976.

Can I Afford To Pay That Much From A Repayment And Risk Standpoint?

After determining a maximum bid price for it to be a profitable long-term investment, most buyers are faced with two even more critical questions: Can I afford to bid that much and yet meet repayment demands? Can I stand the personal and financial risks involved?

Can I Meet Repayment Demands?—A Rough Estimate

Since cash returns on land investments are apt to be considerably lower than market interest rates, land buyers who have to go heavily into debt must answer this question very carefully. Three factors are involved: the amount that needs to be borrowed, the terms of the loan (interest rate and years to repay), and the net cash available to service this land debt. A fourth factor, risk of poor crop yields or low crop prices must also be considered, especially when loan repayment terms appear difficult.

Use the worksheet on page 15 to make a rough estimate as to whether the debt can be repayed on the parcel. First, estimate the net cash flow available for land debt repayment without jeopardizing the rest of the business (section A). The net cash return from land should approximate the residual return calculated in the previous worksheet. To this add any cash expected from building rentals or other cash earnings. Since the market price for land is considerably higher than its earning capacity, every potential buyer must have some snitching room—either in the form of a larger downpayment or excess earnings from the business or off-farm income. The total cash available should then be divided by the acres involved to get the cash available per acre (line A-5).

Table 10. Amount of debt that can be serviced under varying crop prices and loan repayment terms*

Corn/bean price	Net	Years to repay 20	30	40
$1.75/4.00	$ 22	$ 215	$ 250	$ 260
$2.00/4.50	$ 44	$ 430	$ 495	$ 525
$2.25/5.00	$ 67	$ 660	$ 755	$ 800
$2.50/5.50	$ 90	$ 885	$1,015	$1,075
$3.00/6.50	$133	$1,305	$1,500	$1,585
With a change of:		Change in debt service capacity		
Price: 25¢ on corn and 50¢ on beans	($ 22)	$ 215	$ 250	$ 260
Net: $10 per acre	($ 10)	$ 100	$ 113	$ 120

*Assumptions: 110 bushels corn, 34 bushels beans, ½ corn, ½ beans, 8 percent interest, $142 expenses.

Repayment Demands—A Closer Look

If these estimates suggest difficulty in meeting the repayment demands of either the bid or asking price for the farm, a more detailed analysis of your repayment capacity situation is needed.

Two approaches can be used. First is a total farm long-range budget. (The table 10 approach was a partial budget, focusing on the land aspect). The following general procedures can be used.

1. Gross farm sales $_____
2. Nonfarm income _____
3. Farm operating expenses _____
4. Cash farm income (1+2 -3) _____
5. Servicing other debts and replacement _____
6. Withdrawal for living and taxes _____
7. Income available (4–5–6) _____

Multiply the amount on line 7 by the appropriate debt repayment factor from the bottom of page 15. To this add the downpayment available.

Often, in a land purchase, the first 3-5 years are the critical ones. Therefore, a second approach is to work out a transition plan for these early years. Worksheets for this purpose can be found in North Central Extension Publication 34-4, "Managing Our Financial Future."

Next, calculate the debt that can be serviced with these cash earnings by multiplying the cash available per acre by the debt repayment factor that fits expected repayment terms (see table bottom of worksheet). For example, if you have net cash available per acre of $100 and can borrow money at 8 percent for 30 years, you could repay a debt of $1,126 per acre ($100 × 11.26). To this add the cash available for a downpayment.

The result is the price that could be paid and still permit meeting repayment demands. Compare this amount with the asking price or the appraisal price. If the asking price is lower, then you could likely afford to buy it at that price and still meet repayment demands. You should also compare this price with the maximum bid price calculated earlier from an investment standpoint. If the earlier bid price is higher than the one just calculated, then your limitation is a repayment one, meaning you could afford to pay more for the farm, and still make it a profitable investment, but you lack cash available to meet repayment demands.

You should also test the sensitivity of your estimates to changes in net earnings, years to repay, and interest rates in space provided on the worksheet. Table 10 illustrates the importance of making such estimates.

What About The Personal And Financial Risks?

Land purchases under today's conditions can amount to hundreds of thousands of dollars. Prospective buyers must determine whether they can handle this risk exposure from a personal or managerial standpoint as well as financial. If debt servicing appears marginal under normal conditions, then financial risks have increased. The buyer should also look at what the proposed land purchase would do to average per acre land cost of the total farm operation as well as the asset/liability position of the business. Out of pocket land charges on a heavily mortgaged $1,500/acre farm could amount to $150/acre—about double present cash rent. A large mortgage on a base unit could markedly change the complexion of a buyer's net worth statement.

The attitude of the individual (and family) toward added risk and high debt and ability to stand adversity is hard to measure. One of the difficult problems faced by credit people is dealing with people who cannot stand the stresses of earlier financial decisions. This factor should be anticipated and taken into consideration in making your land buying decision.

Part V. Taxes And Other Considerations In Buying And Selling A Farm

If you should become the successful bidder, what next?

Income taxes are one consideration. Most buyers should seek help from a tax adviser in distributing the purchase price of the land to minimize future taxes as the law allows. This will mean allocating as much of the cost as possible to current expense items and depreciable assets. If there is a standing crop and/or a legume seeding, some of the purchase cost can be allocated to that and recouped as an annual expense in the year of purchase. Buildings, tiles, fences, and wells should be set up on appropriate depreciation schedules. However, if buildings are not to be used for any business purpose, they can no longer be depreciated. Investment credit should be claimed on all eligible capital items.

How should the property be owned? Before completing the purchase, review your estate plan. If this property is put in joint tenancy will there be big estate taxes? Should a child's name be included? Who will eventually own the property and what are the gift and estate tax implications of the alternative ways of owning this property?

Is insurance coverage still adequate—both mortgage and property?

For the seller of a farm it is also very important to consult a well-informed tax adviser before the land is sold. The seller may want to avoid selling personal property in the same year that land is sold. The seller may want to sell on the installment basis to avoid having to declare the entire amount of the capital gains increase in the year of the sale. If 30 percent or less of sale price is taken in the first year, the gains can be distributed over the life of the sale.

Part VI. Summary

Land values have almost tripled in five years, largely as a result of the sharp increase in farm earnings at the same time that investment alternatives, both on and off the farm, appeared to be quite limited. Continued longer-term increases in land values are likely. In the shorter term, land values will be less stable than in the past and may experience short periods of decline in response to depressed crop earnings and/or improved alternative investment opportunities.

With the current strong land market and its uncertainties, a potential buyer should explore alternative investments carefully, both farm and nonfarm. A careful analysis may show that investments in a particular tract of land at current prices will provide lower returns over the next few years than other types of investments.

Because land values have changed so rapidly and vary so much within and among areas, a buyer should evaluate each parcel carefully to determine its relative value in today's market. Spending money for a good appraisal may be a very wise investment under current conditions.

Finally, present conditions are so uncertain that it is up to each person to decide how much to pay for land. The successful farm operator who likes land as an investment and sees a wanted piece for sale may find this as good a time as any to buy. At the other extreme, farmers with only average or below average management ability and high cost structures are likely to find that land bought at current prices would provide very poor earnings.

Even the good manager who happens to be in a moderate to weak financial position should analyze cash flow carefully before buying. A large downpayment and/or a subsidy from other parts of the business will probably be necessary since it is almost impossible for a land purchase to pay its own way with current high land prices and interest rates.

Sellers should keep in mind the uncertainties in the current market. It is always easier to sell on an up rather than a down market. For instance, it may be more difficult to find buyers in 1978 given the lower returns to land in 1977. Important considerations for a potential seller include: whether a long or short stay in the land market is planned; and current rate of return and expectations as to land price changes in the next few years.

Worksheet 1. How much is land worth to me?

Income		Total
Crop		
Acres		
Yield		
Production		
Price		
A. Expected return		$
Direct costs		
Seed		
Fertilizer		
Herb.+insect.		
Fuel+oil		
Custom hire		
Crop insurance		
B. Total direct costs		$
Related operating and overhead		
Machinery+equipment		
Repair	$	
Depreciation or replacement		
Interest		
Trucking+marketing		
Real estate—taxes		
—maintenance		
Insurance		
Labor+management		
Miscellaneous		
C. Total related expenses		$
D. Total costs (B+C)		$
E. Residual return to land (A−D)		$
F. Land value (E÷capitalization rate —%)		$
G. Adjustments for location, bldgs., etc. (±)		$
H. Estimated value of land (F±G)		$
I. Land value/acre (H÷acres)		$

Sensitivity analysis: Effect of change in prices, costs and capitalization rate

Residual return per acre	**Capitalization rate**		
	4%	**5%**	**6%**
		value/acre	
$			
$			
$			

Worksheet 2. Determining whether land debt can be serviced

	Expected	Optimistic	Pessimistic
A. Estimate net cash flow available (Cash available for land debt repayment without jeopardizing rest of business)			
1. Net cash returns from land			
2. Building rental, etc.			
3. Other cash earnings available			
4. Total expected annual cash available			
5. Cash available per acre (4 ÷ acres)			
B. Calculate debt per acre that can be amortized			
1. Cash available per acre (A, 5)			
2. Times debt repayment factor (see table)			
3. Equals debt per acre can be carried			
C. Compare asking price with debt that can be carried			
1. Debt per acre can be carried (B, 3)			
2. Plus per acre downpayment available			
3. Price per acre could be paid			
4. Present asking price per acre			
5. Difference			

Debt repayment factors
Amount of debt $1 per year will cover—even payment

Repayment period in years	Annual interest rate 6%	6.5%	7%	8%	9%	10%
10	$ 7.36	$ 7.19	$ 7.02	$ 6.71	$ 6.42	$ 6.14
20	11.47	11.02	10.59	9.82	9.13	8.51
30	13.76	13.06	12.41	11.26	10.27	9.43
40	15.05	14.15	13.33	11.92	10.76	9.78
forever (interest only)	16.67	15.38	14.29	12.50	11.11	10.00